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Oak Lake Field Station 30th Anniversary Retreat
Presentations

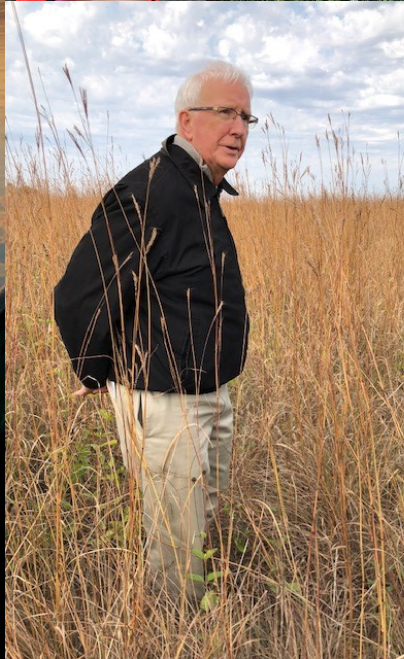
Oak Lake Field Station

2019

Oak Lake Field Station : Perspectives of a Field Station Director

Nels H. Troelstrup Jr.

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OAK LAKE FIELD STATION

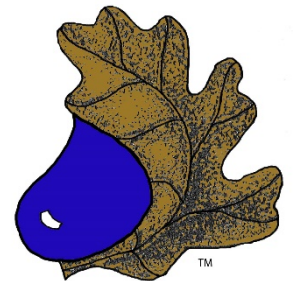
PERSPECTIVES OF A FIELD STATION DIRECTOR

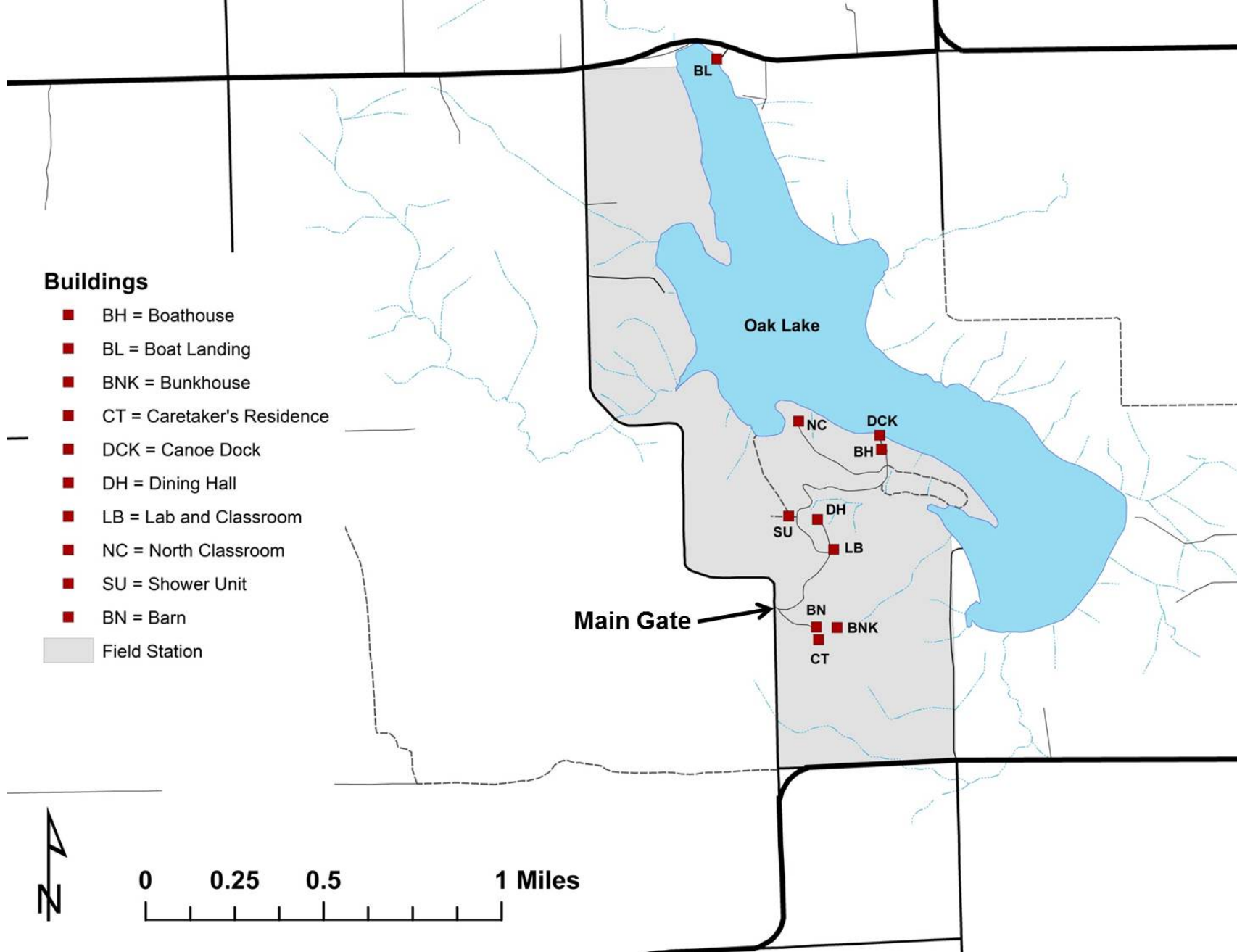


**SOUTH DAKOTA
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College of Agriculture, Food
and Environmental Sciences

ACKNOWLEDGEMENTS

Oak Lake Field Station is a facility of the South Dakota Agriculture Experiment Station. Support for the field station is provided through user fees, private donor endowments, Department of Natural Resource Management, South Dakota Agriculture Experiment Station and South Dakota State University. Thanks are extended to the many students and faculty who have invested time and effort toward the station, Dr. Michele Dudash for her continued support of station programs and facilities, Dr. Bill Gibbons and Missy Vande Weerd for support through the South Dakota Agriculture Experiment Station and President Barry Dunn for his teaching as a faculty member and support as both Dean and President of SDSU.

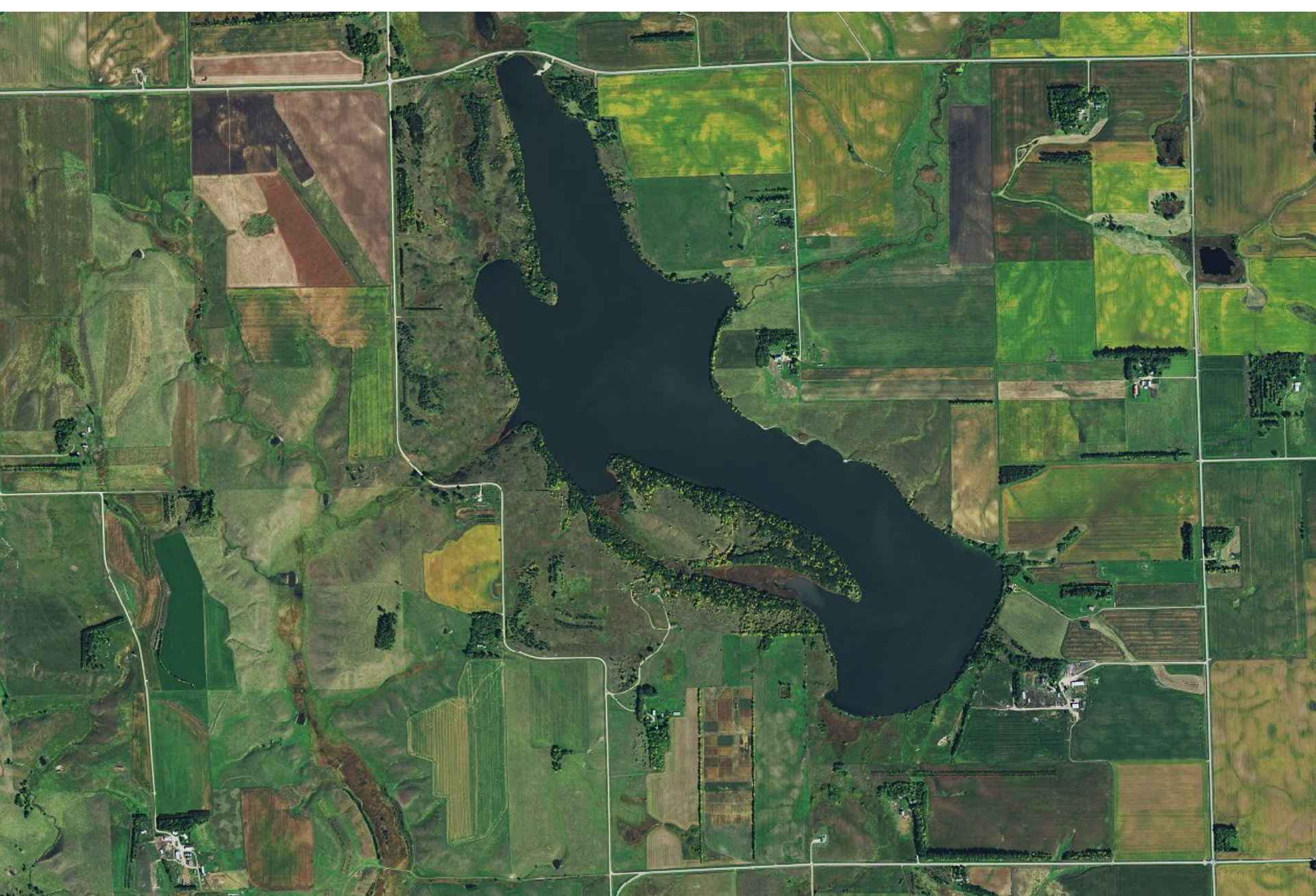




LAND COVER TODAY

Cover Class	Acres	%
Rangeland & Pasture	409	71.8
Cropland	35	6.1
Forest	74	13.0
Wetlands	46	8.1
Roads & Developed	6	1.0

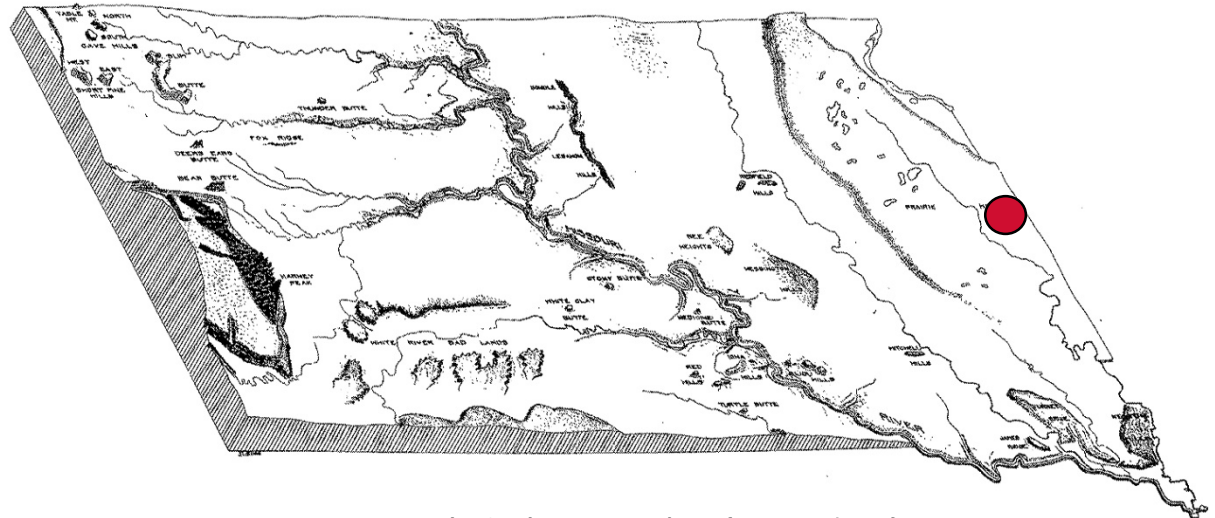




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COTEAU DES PRAIRIE

- Named by French Fur Trappers
- Translated means “Prairie Hills”
- Formed from glacial drift
- Pinched between lobes of Wisconsin Ice Sheet
- Unique Attributes:
 - Glacial history
 - Soils
 - Potholes
 - Habitat Diversity
 - T/E Species
 - Location
 - Size & Facilities
 - Temporal Stability

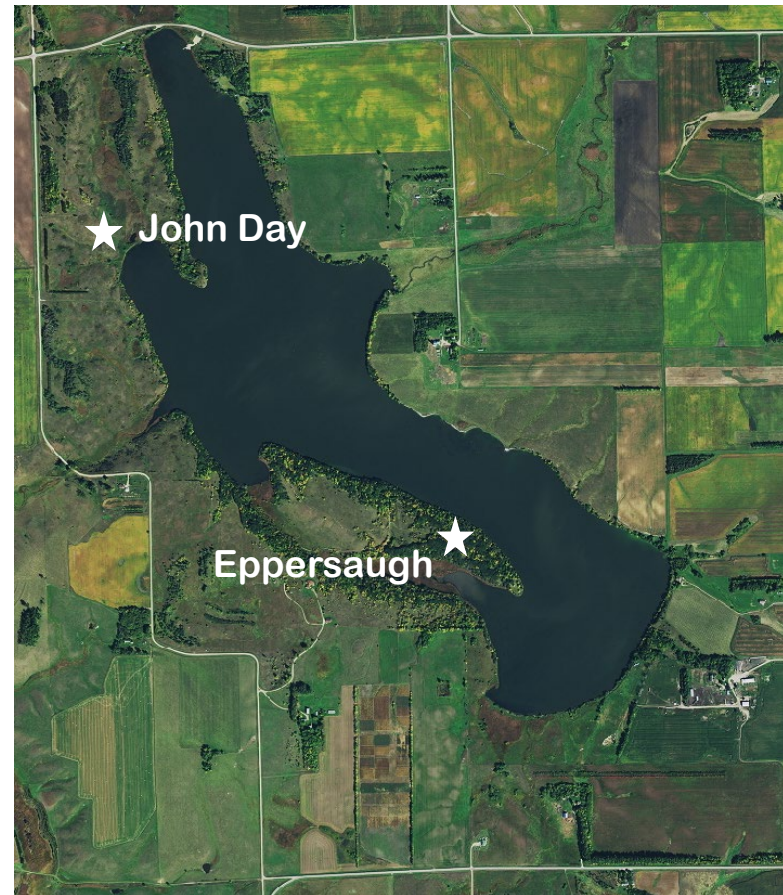


Lithrock (1943)



EXPLORATION & SETTLEMENT

- Nicollet and Fremont ~ 1838
- German Trapper (Eppersaugh) ~ 1865
- Squatter in Sod Hut (John Day) ~ 1873
- Winona & St. Peter R.R. in 1875
- Kristin Lunde - North Farm in 1886
- John Knudson – South Farm in 1882



THE “BOWERY”

- A stage-like structure was located on the Peninsula, constructed in 1910.
- Used to host Fourth of July dances.
- Couples could pay 5 cents for a dance or purchase a ticket to dance all night.
- Closed in 1920.



Scan of original ticket



Kermit Torgeson - Astoria, SD



Hand-drawn map of Section 18, Township 112, Range 48. The map shows a grid of land parcels with various owners and acreage. The parcels are labeled as follows:

- Parcel 1:** Bogen 1/2, 27
- Parcel 2:** Guri Trovian 1/12, 12
- Parcel 3:** Anne Bogen 1/12, 11
- Parcel 4:** Hanson Lot 1, 19
- Parcel 5:** Guri Trovian Lot 2, 8 3/4
- Parcel 6:** Winsness Farneth Lot 3, 8 3/4
- Parcel 7:** Fjerseth Lot 4, 8 3/4
- Parcel 8:** Trovian Lot 5, 5 1/3
- Parcel 9:** J. D. Dyer Lot 6, 5 1/3
- Parcel 10:** Anne Bogen Lot 7, 5 1/3
- Parcel 11:** Winsness Farneth Lot 8, 5 1/3
- Parcel 12:** Winsness Farneth Lot 9, 5 1/3
- Parcel 13:** Winsness Farneth Lot 10, 5 1/3
- Parcel 14:** Winsness Farneth Lot 11, 5 1/3
- Parcel 15:** Winsness Farneth Lot 12, 5 1/3
- Parcel 16:** Winsness Farneth Lot 13, 5 1/3
- Parcel 17:** Winsness Farneth Lot 14, 5 1/3
- Parcel 18:** Winsness Farneth Lot 15, 5 1/3
- Parcel 19:** Winsness Farneth Lot 16, 5 1/3
- Parcel 20:** Winsness Farneth Lot 17, 5 1/3
- Parcel 21:** Winsness Farneth Lot 18, 5 1/3
- Parcel 22:** Winsness Farneth Lot 19, 5 1/3
- Parcel 23:** Winsness Farneth Lot 20, 5 1/3
- Parcel 24:** Winsness Farneth Lot 21, 5 1/3
- Parcel 25:** Winsness Farneth Lot 22, 5 1/3
- Parcel 26:** Winsness Farneth Lot 23, 5 1/3
- Parcel 27:** Winsness Farneth Lot 24, 5 1/3
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- Parcel 35:** Winsness Farneth Lot 32, 5 1/3
- Parcel 36:** Winsness Farneth Lot 33, 5 1/3
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- Parcel 38:** Winsness Farneth Lot 35, 5 1/3
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- Parcel 126:** Winsness Farneth Lot 123, 5 1/3
- Parcel 127:** Winsness Farneth Lot 124, 5 1/3
- Parcel 128:** Winsness Farneth Lot 125, 5 1/3
- Parcel 129:** Winsness Farneth Lot 126, 5 1/3



- Pete Winsness
- Andrew Haugland
- Ellef Trooien
- Hans Digre
- Andrew Knutson
- Pete Hanson
- Ole Fjeseth
- Iver Goodoien
- Martin Goodoien
- Ole O. Trooien
- Peter Trooien

WOOD LOT CREW 1924



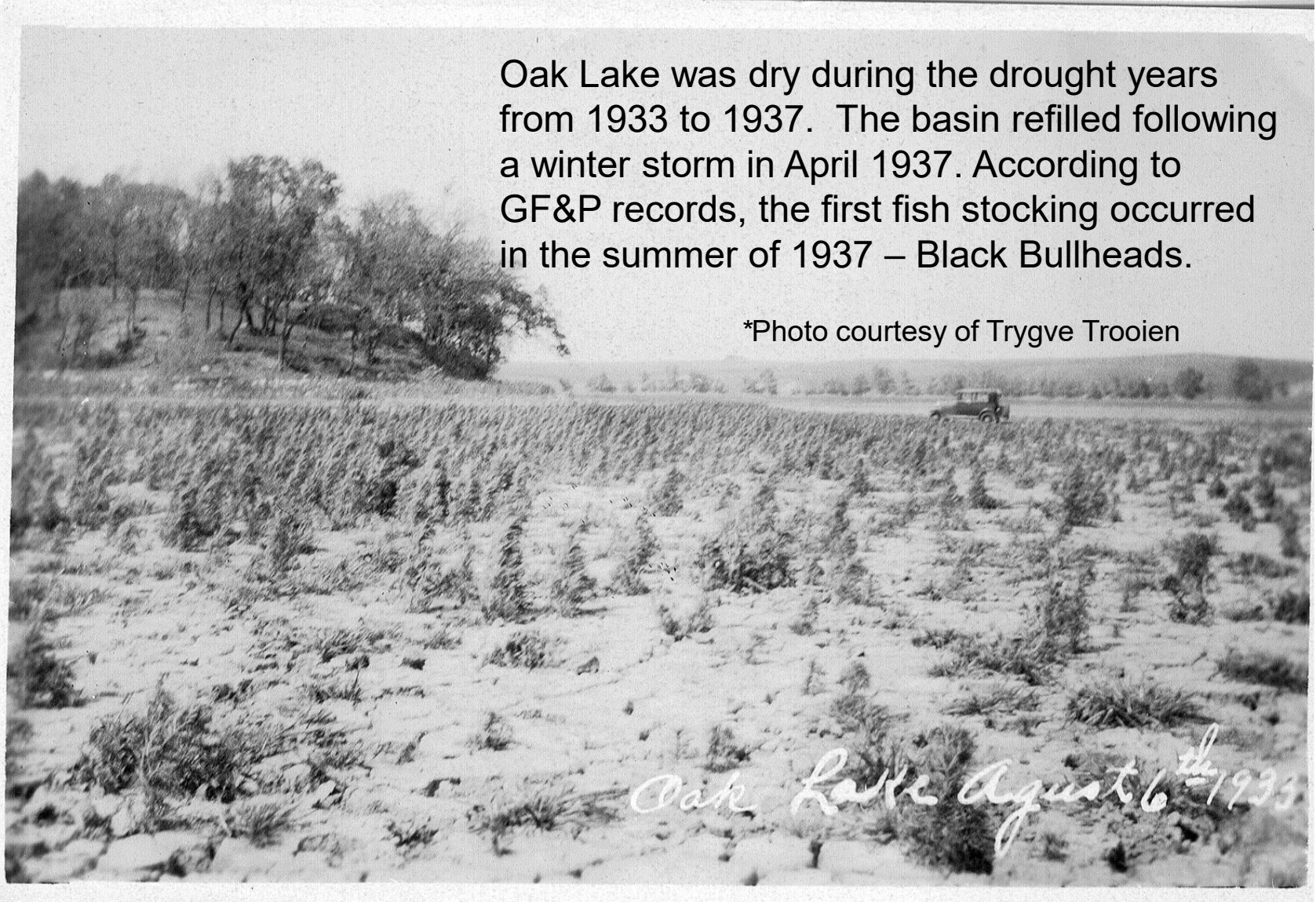
Photo courtesy of Trygve Trooien - Astoria, SD



OAK LAKE - AUGUST 6, 1933

Oak Lake was dry during the drought years from 1933 to 1937. The basin refilled following a winter storm in April 1937. According to GF&P records, the first fish stocking occurred in the summer of 1937 – Black Bullheads.

*Photo courtesy of Trygve Trooien



OWNERSHIP HISTORY

- The station occupies 570 acres. Eight property lots on the station.
- Winona-St. Peter Railroad - September 1881
- Private owners totaling 20-34 per lot.
- MinnlaKota Girl Scout purchases, 1963 to 1973
- SDSU long-term lease December 8, 1988

We have the ownership history of lots on the station property. The Trooien family has three overlapping generations of daily diary entries. We don't have those diaries but we do have connections with the Trooien Family as they established the Rogen-Trooien endowment for the field station.



KEY PEOPLE IN THE ACQUISITION



SDSU President Robert Wagner



College of Ag/Bio Dean David Bryant



Bio/Micro Dept Head Charles McMullen

Oak Lake was acquired through a land trade between South Dakota Schools and Public Lands and the MinnlaKota Girl Scout Council - 1988. The agreement specified that SDSU would manage the property as a biological field station and would provide the GSA with free use of the site for a period of 50 years. SDSU would in-turn operate under a long-term lease with Schools and Public Lands.



OAK LAKE FIELD STATION DIRECTORS

- Chuck McMullen served double duty as the Bio/Micro Department Head and Field Station Director from 1988 until Fall 1993
- I came on board August 1, 1993
 - My original appointment - 9 month – 100% Teaching
 - My first impression of Oak Lake:
 - New as a facility – nothing established
 - Has potential
 - Raw
 - Very limited budget
 - Unsupported groundskeeper

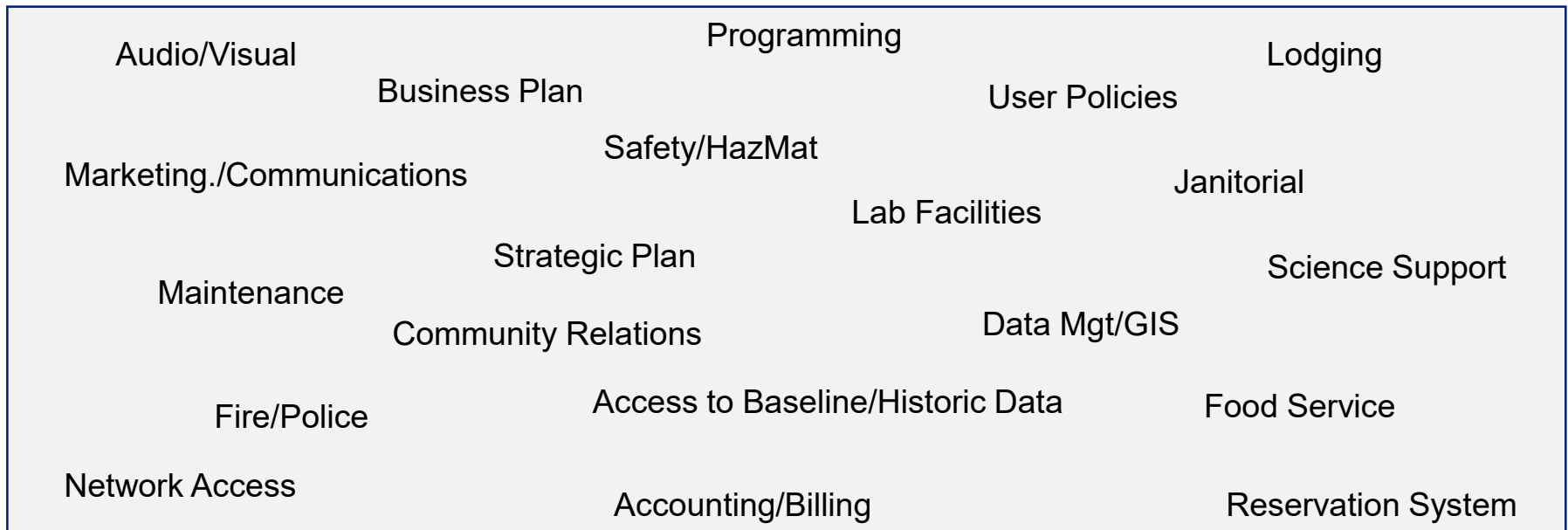


MICHAEL ABELS – TOOLIK FIELD STATION, AK

You need to look at your field station as a small city, even if you only have one cabin, you are the mayor.

Your station needs all services a city provides but on a smaller scale.

If your station only has one building, and one staff member, all of these services have to be addressed.



THE OAK LAKE COMMITTEE

- Representative faculty from throughout campus
- Assist the director in setting policies, fee structure, programming
- Communicate back to their departmental units
- Originally appointed by the SDSU President's Office
- Replacements appointed by the director

Current and Remaining Members

Dr. Arvid Boe

Dr. Jim Doolittle

Dr. Paul Johnson

Dr. Dean Kattelman

Dr. Nels Troelstrup



ESTABLISHING THE ADVISORY GROUP

Current Advisory Group Members:

Bill Schultze – Hendricks, MN (ret USFWS)

Kelly Bucholz – Hendricks, MN

Liz Christiansen – Astoria, SD (ret SDSU Extension)

Lowayne Junke – Hendricks, MN

Charles Woodard – Brookings, SD (Emeritus Distinguished Professor SDSU)

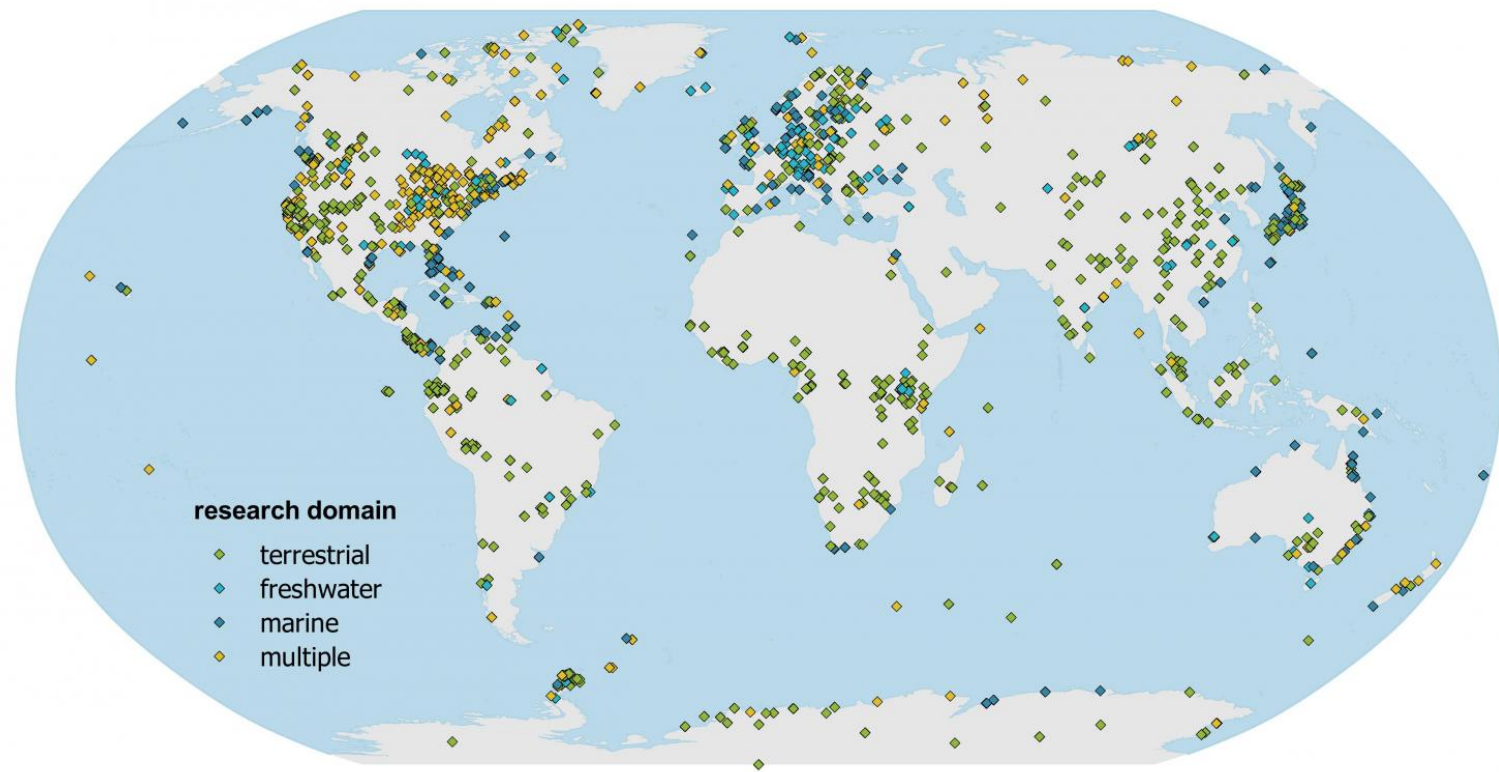


Trygve Trooien – Astoria, SD

Role – serve as a sounding board for station policies and programs, facilitate fund raising, communicate with the public. Our original advisory group was established in the mid-1990's and consisted of 12 members representing Brookings, Astoria, Hendricks, Toronto and White. They represented a mixture of professions, genders and backgrounds. Group size has decreased through attrition.



WHO ARE OUR PEERS?



**Organization of Biological
Field Stations**

*Supporting environmental research, education, and
public understanding*



**SOUTH DAKOTA
STATE UNIVERSITY**
*College of Agriculture, Food
and Environmental Sciences*

NSF REVIEW AND THE STRATEGIC PLAN

<u>Personnel</u>	<u>Affiliation</u>	<u>Panel Participation</u>
Susan Lohr	Rocky Mountain Biological Station	Facilitator/Coordinator
David Biesboer	Lake Itasca Forestry and Biological Station	Admin & Funding
Michael Klug	Kellogg Biological Station	Admin & Funding
Robert Stine	Cloquet Forestry Center	Admin & Funding
Dan Dawson	Sierra Nevada Aquatic Research Lab	Facilities
Kenneth Lang	Iowa Lakeside Lab	Facilities
Chris Wassner	Shortgrass Steppe Field Station	Facilities
Mary Batterson	Cedar Point Biological Station	Programs
Steven Moshier	Wheaton College Science Station	Programs
Stephen Tonsor	Pymatuning Laboratory of Ecology	Programs

- NSF provided support for a planning effort in 1998
- Dr. Susan Lohr was asked to facilitate the review
- Strategic plan developed from review team recommendations in 1999



OAK LAKE BECOMES AN AES STATION

- President Elliott realigns reporting of the station within AES and the Department of Bio/Micro
- Annual O&M established
 - AES
 - Central Administration
- Rogen-Trooien Endowment established
- John Haertel Endowment established
- Undergraduate research grants established
 - John Haertel Endowment – Vertebrate Research
 - Oak Lake UG Research Award
 - Charles & Marcia McMullen Award – added later



President Peggy Gordan (Elliott) Miller



Dean Fred Cholick - ABS



NSF SUPPORTS NEW LAB/CLASSROOM



SHIFT IN USER FEES

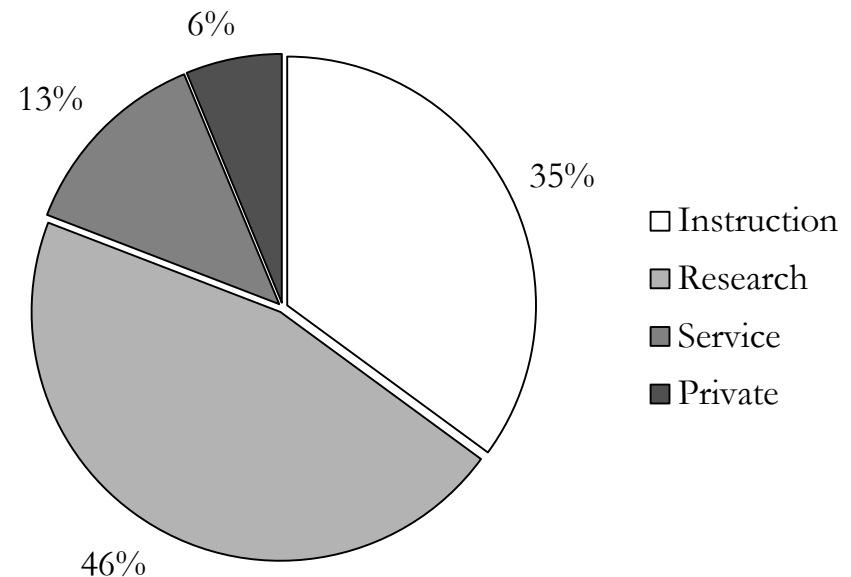
- Oak Lake Field Station has always charged fees for use
- Fee structures vary among field stations
- Early use was public heavy
- NSF recommended research incentives and shifting fee structure to restructure users
 - Undergraduate research grants established
 - Fee structure split – academic and non-academic
- End result – total users dropped, campus/educational users increased as a percent of total, research increased
- Fee structure based on OBFS survey of station fees
 - Focus on ability to pay and attracting users
 - Not focused on recovering full costs



FIELD STATION UTILIZATION

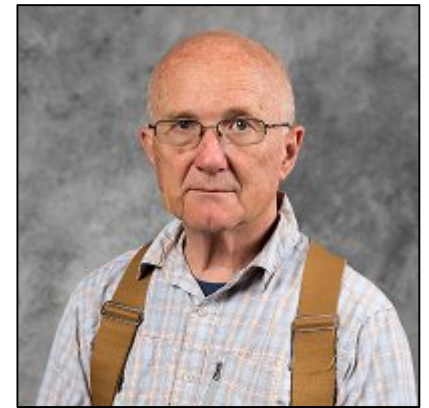
- Total Group Use – 1,283
- Total User Days – 65,663
- Average No. Groups – 43 yr⁻¹
- Average User days – 2,189 yr⁻¹
- Average Group Size - 20
- Average Group Duration - 6 days
- Average university courses – 10 yr⁻¹
- Average research projects – 7 yr⁻¹
- Undergraduate research projects* – 6 yr⁻¹
- Graduate thesis/dissertation projects* – 5 yr⁻¹
- Peer reviewed publications* – 4 yr⁻¹
- Funded research support (self reported) - \$700K – \$3.0M

*since development of research incentives grants



STAFFING CHANGES

- Oak Lake Groundskeeper
 - Original position was unpaid – Service for Service
 - Now 100% time position – split with WLRU
- Office Staff
 - Previously, one staff member handled reservations, billings and accounting
 - Ji Young handles reservations, web page, Facebook and Beth Byre handles billings and accounting



The help these folks provide is essential for the functioning of the station. Many thanks for their hard work and support.



FACILITIES: HOUSING

Bunkhouse: Cap 80 in dbl bunks,
wood burning stoves, no water.



Dining Hall:
3 bedrooms (Cap 15)
2 bathrooms
Kitchen
Dining Room (Cap 120)
Not heated



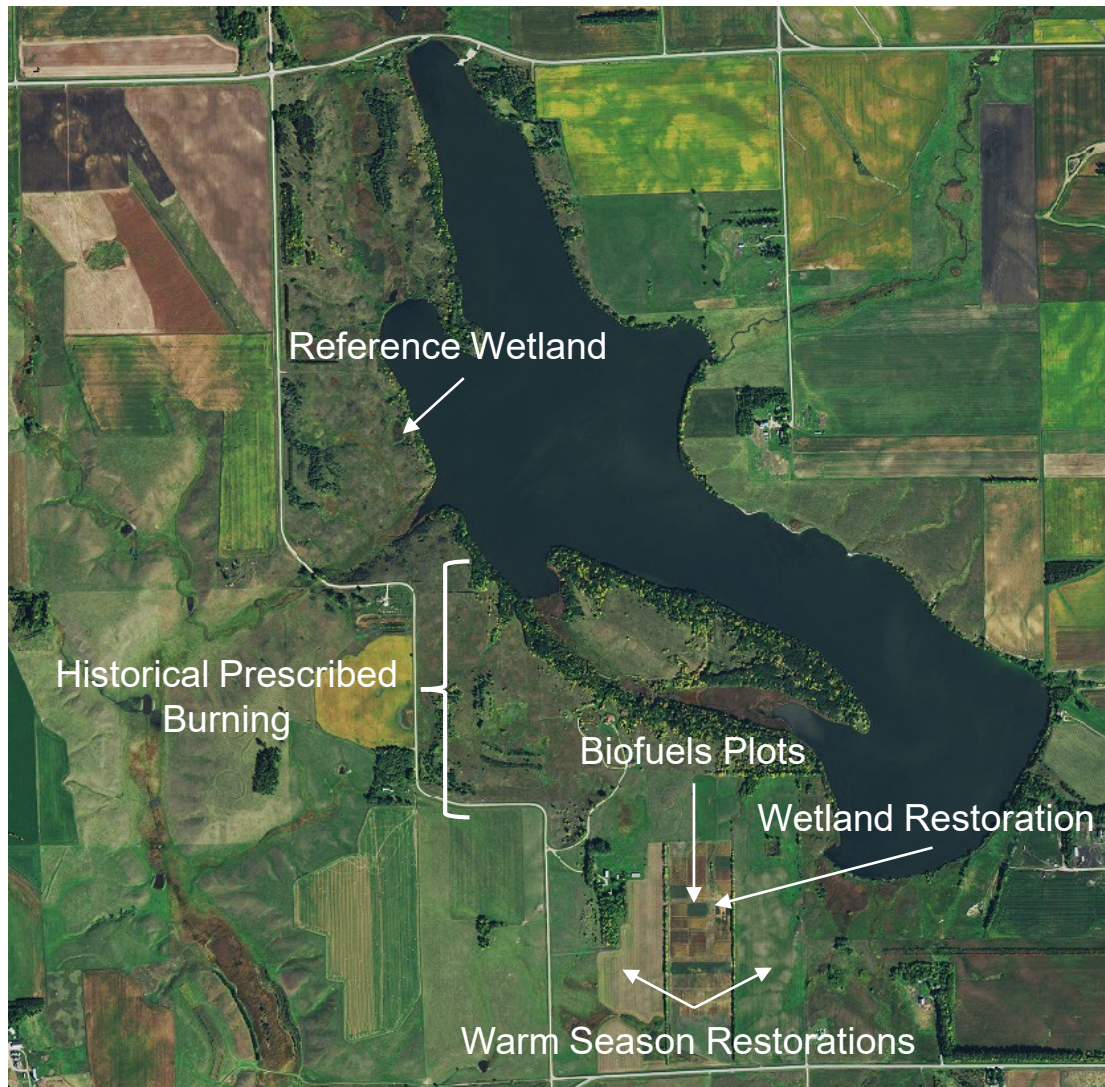
NEW HOUSING - 2018!



The old South Farm House was demolished this past summer and replaced with a much newer three bedroom house over a new basement. The basement doubles as a storm shelter capable of holding 80 people. Thanks are extended to President Dunn and Facilities & Services for their effort to get the house moved and completed this past summer.



MANAGEMENT ACTIVITIES



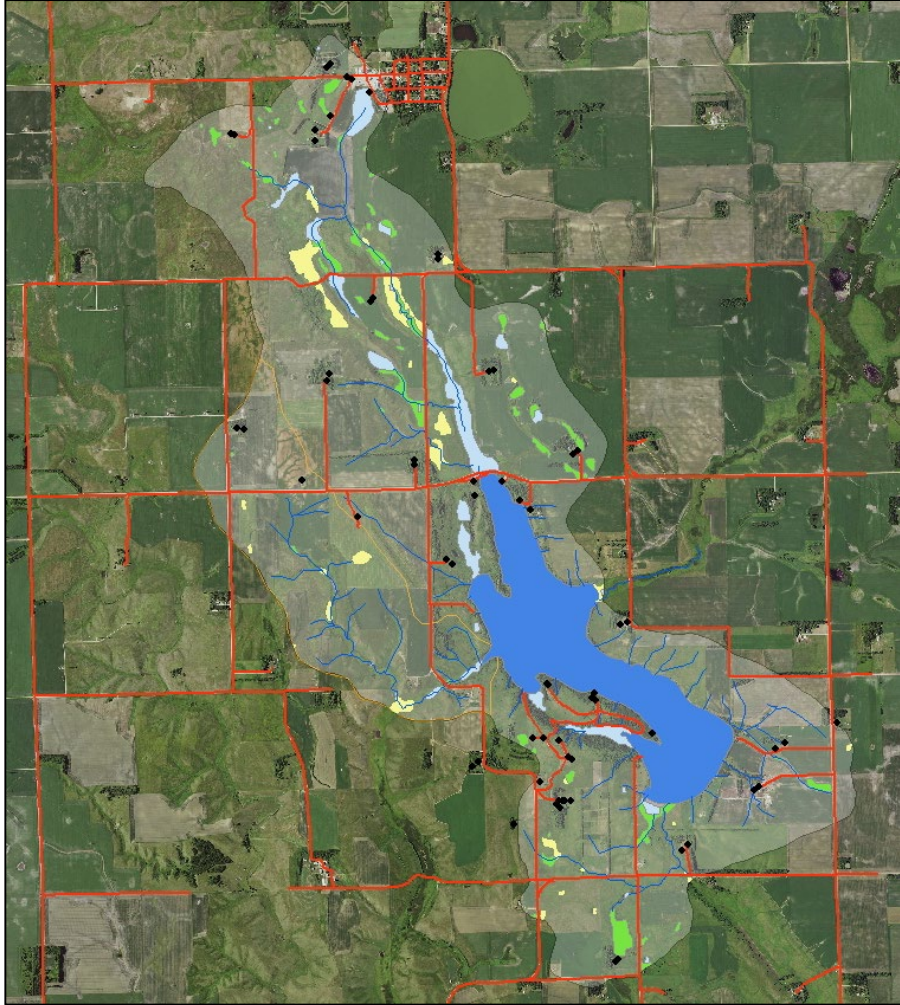
Spring Burning



USFWS Wetland Restoration



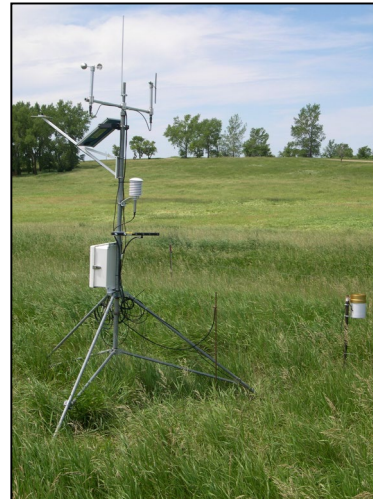
SUPPORTING ACTIVITIES



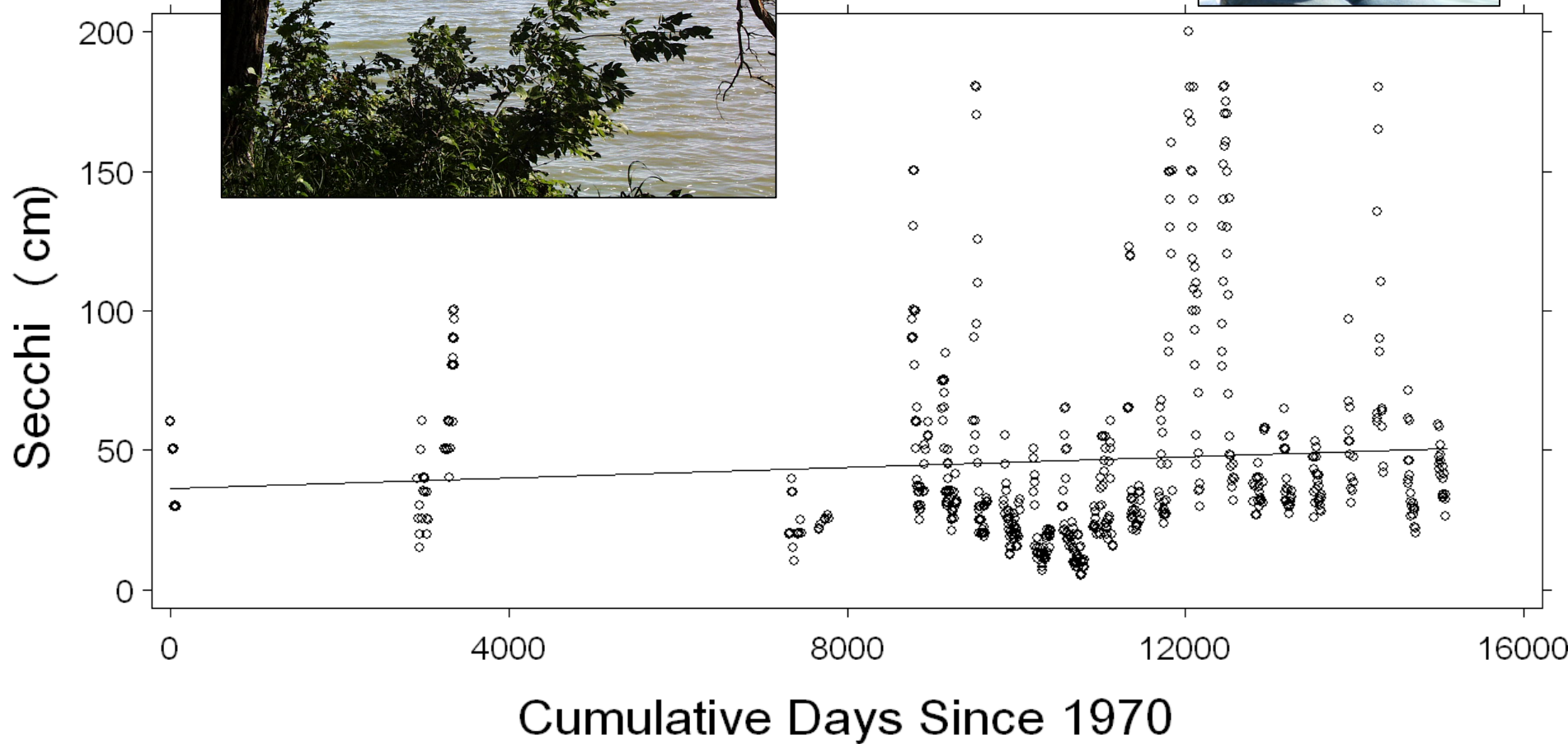
Oak Lake GIS



Weather/Stream Monitoring



LAKE MONITORING



LIST OF COURSES USING STATION

ABE 733 Groundwater Engineering

BIOL 101 Intro Biology

BIOL 103 Intro Biology

BIOL 492 Topics Biology

BOT 127 Ethnobotany

BOT 419 Plant Ecology

ENGL 479 Capstone in English

EES 425 Disturbance Ecology

NRM 230 NRM Techniques

NRM 311 Ecology Lab

NRM 450 FW Monitoring Assess

RANG 205 Intro to Range

RANG 492 Topics Range

SDSU ROTC Land Navigation

SEED 413 Science Methods Teaching

WL 363 Ornithology

WL 411 Prin Wildl Management

WL 417 Large Mammal Ecology

WL 418 Ecology Aquatic Inverts

WL 427 Limnology



INSTRUCTIONAL ACTIVITY



Student training in field ecology and habitat assessment.



USFWS range plant identification training.



INSTRUCTIONAL ACTIVITY



Instructors take SDSU ROTC students through their paces on our orienteering course.

USDA carabid (ground) beetle identification and ecology workshop.



CURRENT RESEARCH ACTIVITY

▪ Undergraduate Research

- Lindsey Meier – Wetland Mesocosm Study – Response of Wetland Invertebrate Assemblage Structure to Pulsed and Pressed Drying.
- Ashley Nilson – South Dakota Aquatic Invertebrate Collection
- Jennifer Dailey – Wetland Restoration Hydroperiod, Water Quality and Invertebrates

▪ Graduate Research

- Kate Wollman – Mussel Age/Growth vs Lake Trophic State
- Shane Stiles – Pollinator Research

▪ Post-Doctoral Research

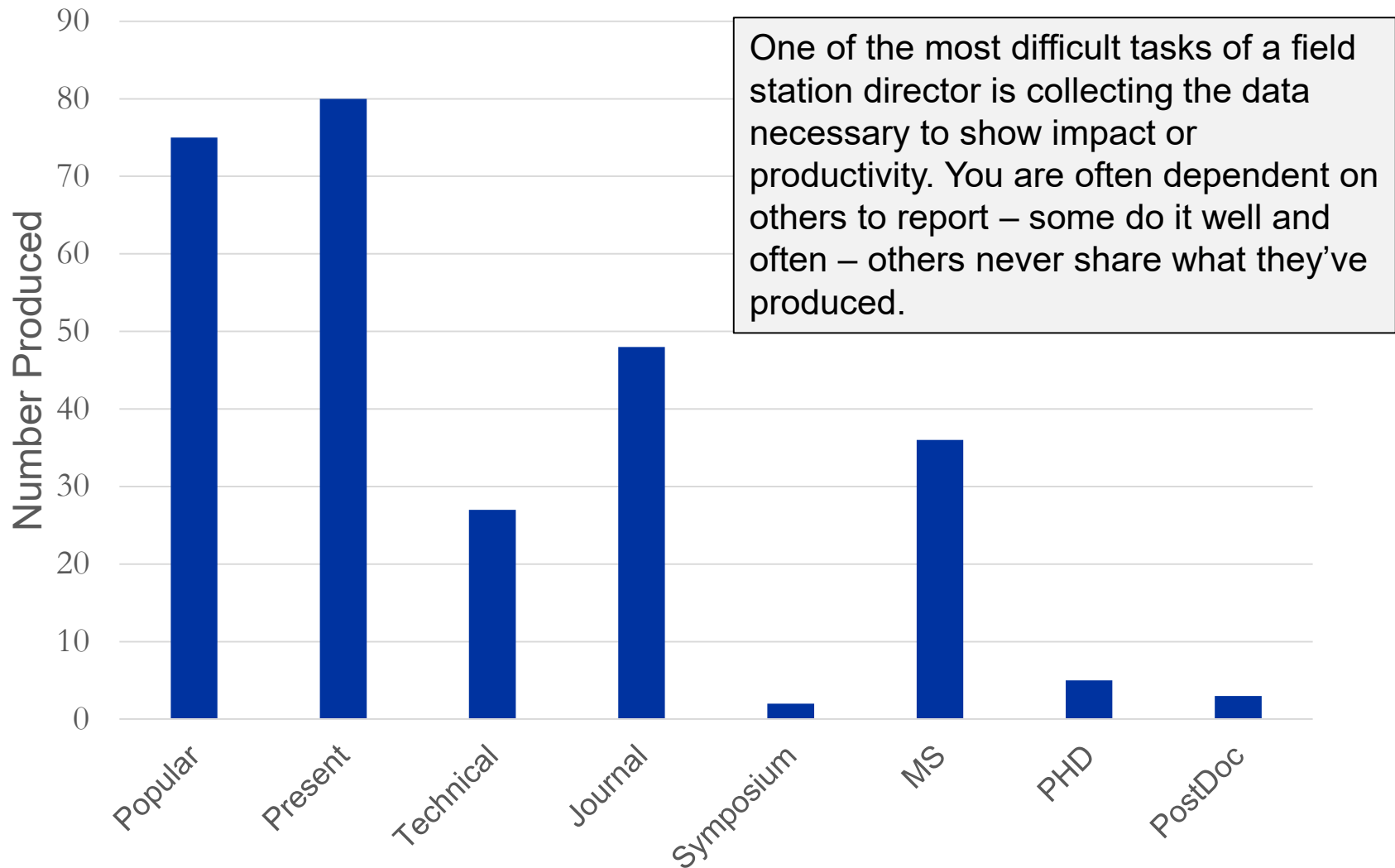
- Ellen Welti – Post-Doc - University of Oklahoma – Ant Limiting Resource Research
- Henning Nottebrock – SDSU – Pollinator Research

▪ Faculty Research

- Arvid Boe – Cellulosic Biofuels and Pollinator Research
- Volker Brozel – Nitrogen Cycling in Prairie Soils Research
- Charlie Fenster – Pollinator Research
- Mike Hildreth – Mosquito Vector Habitat Research
- Nels H. Troelstrup, Jr. – Freshwater Invertebrate Biodiversity Research
- Xu Lan – Prairie Bud Bank



RESEARCH PRODUCTIVITY



JOURNALS REPRESENTED

Canadian Journal of Zoology
Chemical Ecology
Ecological Indicators
J. Am. Horticultural Society
Journal of Extension
Journal Kansas Entomol Soc
Plant Diseases
Plant Physiology
Prairie Naturalist

Principally Speaking
Proc SD Academy Science
Proc Entomol Soc Washington
Rangeland Ecology & Mgt
Remote Sensing
Sheep & Goat Research
The Coleopterists Bulletin
Zootaxa

The Oak Lake Research Retreat was initiated in 2006 – 127 research presentations have been presented to participants of the retreat since it started.



RESEARCH OPPORTUNITIES

- Wetland restoration
- Oldfield restoration
- Habitat requirements of endangered butterflies
- Overwintering hibernacula of redbelly snakes
- Vegetation and animal response to fire
- Animal responses to vegetation mosaics
- Decadal trends in spring bird counts
- Decadal trends in shallow prairie lake trophic state

The field station offers up to three undergraduate research grants each year. These grants are competitively awarded and best when combined with other funding support.



UNDERGRADUATE RESEARCH



Lyntausa Kuehl
preparing to
perform a
light/dark bottle
production
measurement on
Oak Lake.

The Oak Lake Research Retreat is held every fall in October. The retreat has delivered 127 presentations to participants since it began in 2006.



GRADUATE RESEARCH

Field stations should offer facilities to researchers outside the institution. Visiting students from Hastings College, Manchester Metropolitan University, University of Minnesota-Duluth, Oklahoma State University, University of Oklahoma, Purdue University and the University of Texas have all used the station to complete degrees.



Several of our own SDSU graduate students have utilized the station for their graduate research. Here, Arjun Kafle validates stream reference sites and develops an index of biotic integrity for eastern SD streams.



Retreats



Public Learning Activities



Camps and Workshops



Tribal Writers Retreat



AN EYE TO THE FUTURE...

- Continued efforts on wetland restoration
- Focus on prairie restoration and pollinators
- Re-establishing fire management
- Enhanced efforts to understand climate change effects on prairie ecosystems
- Enhanced engagement with the public through our Advisory Group
- Establishing a wireless sensor array
 - Facilitate remote teaching uses
 - Provide real-time data for research
 - Contribute to established networks
- Networking with other field stations



www.sdstate.edu/oak-lake



*All the world is a laboratory to the inquiring
mind. – M.H. Fischer*